

FLIGHT

The
AIRCRAFT
ENGINEER
&
AIRSHIPS

First Aero Weekly in the World

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

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EDITORIAL COMMENT.



THE history of civil aviation, as distinct from so-called "commercial" aviation, in Great Britain during the last four or five years has been one of steadily-decreasing activity. Shortly after the war it began to look as if we should see a revival of the air racing of pre-war days, and a very good start was made, what with Aerial Derbys, inter-University races, etc. Then gradually one air racing event after another had to be cancelled, the most regrettable of all being, perhaps, the Aerial Derby, which had become the British speed race of the year. If one looks for the reasons there are several that have contributed towards this lamentable state of affairs, but in the end they all appear to boil down to practically but one main obstacle: lack of money. Shortly after the war the aircraft industry was in a flourishing condition, and it was at that time hoped and believed that the feverish activities of the war years would gradually be transferred, probably in a somewhat diminishing degree, to civil aviation, once peace was restored. This, as we now know to our cost, did not prove to be the case, but while that hope lingered the aircraft industry was prepared to, and did, spend not inconsiderable sums of money on the production of racing machines. As the years went by, however, and the slump came, money became very scarce indeed, and the majority of British firms were not in a position to spare more than a minimum on sporting aviation.

Up to this time, it should be noted, air racing had been kept alive mainly by the aircraft industry building and entering machines for air races and events, without much thought for the value of the prizes offered. When the difficult times came, the question of prizes assumed considerably greater importance, and the decline of air racing and flying meetings from then onwards can, we think, be attributed mainly to the relatively small value of prizes offered in very important aviation events.

DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list:—

1925

- Dec. 15 M. E. Dewoitine. "The Advantages of Metal Construction," before Inst.Ae.E.
Dec. 16 Air Vice-Marshal Sir W. Sefton Brancker. "Air Communications in the Middle East," before Royal United Service Institution.

1926

- Jan. 12 Mr. C. Howarth. "Some Aspects of Full-Scale Experiments," before Inst.Ae.E.
Jan. 26 Lieut. Olechnovitch. "The Care and Maintenance of Tools as an Important Factor in Workshop Routine," before Inst.Ae.E.
Feb. 9 Informal Meeting, Inst.Ae.E.
Feb. 25 Mr. A. J. Cobham. "Long-Distance Aeroplane Flights," before R.Ae.S.
Mar. 9 Mr. O. E. Simmonds, M.A., A.F.R.Ae.S., M.I.Ae.S. "The Development of Civil Marine Aircraft," before Inst.Ae.E.

To take again as an example the Aerial Derby. This race is of an international character, but when it is remembered that machines for this event, in order, to have any chance at all, must be of such high power that their cost runs into several thousands of pounds, while the first prize offered was but a few hundred, it will be realised that there was little incentive to enter machines, and the one event that might have become an international affair at last had to be abandoned.

The Royal Aero Club is, as is of course well known, entrusted with the organisation of aviation sporting events in Great Britain, but it cannot be expected to find entirely out of its very modest subscription funds sufficient money to be able to offer really substantial prizes. As it is, the Royal Aero Club has given prizes during the last few years totalling £4,000 up to 1923. In 1924 a Racing Fund was opened and close upon £2,000 was collected, most of which was subscribed outside the Club. In 1925 for the Racing Fund something like £1,000 was collected and spent on air racing. Considerable as are these amounts, they have proved inadequate, and the Royal Aero Club is now faced with the problem of not only how to increase the amounts, but how to maintain them in the future.

A number of well-wishers of aviation have, in the past, contributed handsomely towards the Club's racing fund, Mr. Samuel Samuel and Sir Charles Wakefield heading the list with no less than £1,000 each, and others have given various smaller amounts. But generally speaking, it can, we think, be said that the general members of the Royal Aero Club have not contributed as much as might have been expected, and we understand that the Royal Aero Club is now in the very serious position of running at a loss, and that as a result it has been suggested that the subscription fee should be raised by one guinea. This matter will be the subject for discussion at the Special General Meeting to be held at the Club on Wednesday next, December 16.

Personally, we think, if possible, it were better not to raise the subscription fees, modest as they are, at present. In the case of ordinary members, the subscription would be increased from five guineas to six, and service members would be called upon to pay three guineas instead of the present two guineas. Yet it is quite evident that something must be done, and done without delay. The Royal Aero Club can justly claim that since the Club was founded, practically as a Society of Encouragement, in 1901, with a capital of £3-11s.-0d., members have never been asked to subscribe any funds towards the running of the Club, other than their yearly subscriptions, although on the other hand, these have been necessarily slightly increased, and now a further advance is suggested.

If there really is no other way out, we would suggest that it might be made a condition of the raised subscription that the whole of the extra money provided in this way be devoted to air racing. If that were done, it appears to us that members could feel they were individually doing something really useful and valuable in the way of helping to revive air racing in Great Britain. At the same time, it is to be hoped that all who can do so will contribute towards the special Royal Aero Club Racing Fund. Small contributions are as gratefully accepted as large ones, whilst it is to be remembered that the Racing Fund provides a most excellent means of supporting sporting aviation in Great Britain, and Club members who are personally acquainted with wealthy people would be doing aviation a very real service by convincing them of the vast amount of good that could be done by substantial contributions. In the main, it is a question of making a good start again. The Aerial Pageant has shown that the general public is willing to go to flying meetings, provided there is something worth watching. A really good meeting can hardly be expected unless the prizes are substantial, and they can only be so, provided the Racing Fund is supplied with the necessary finances to that end.

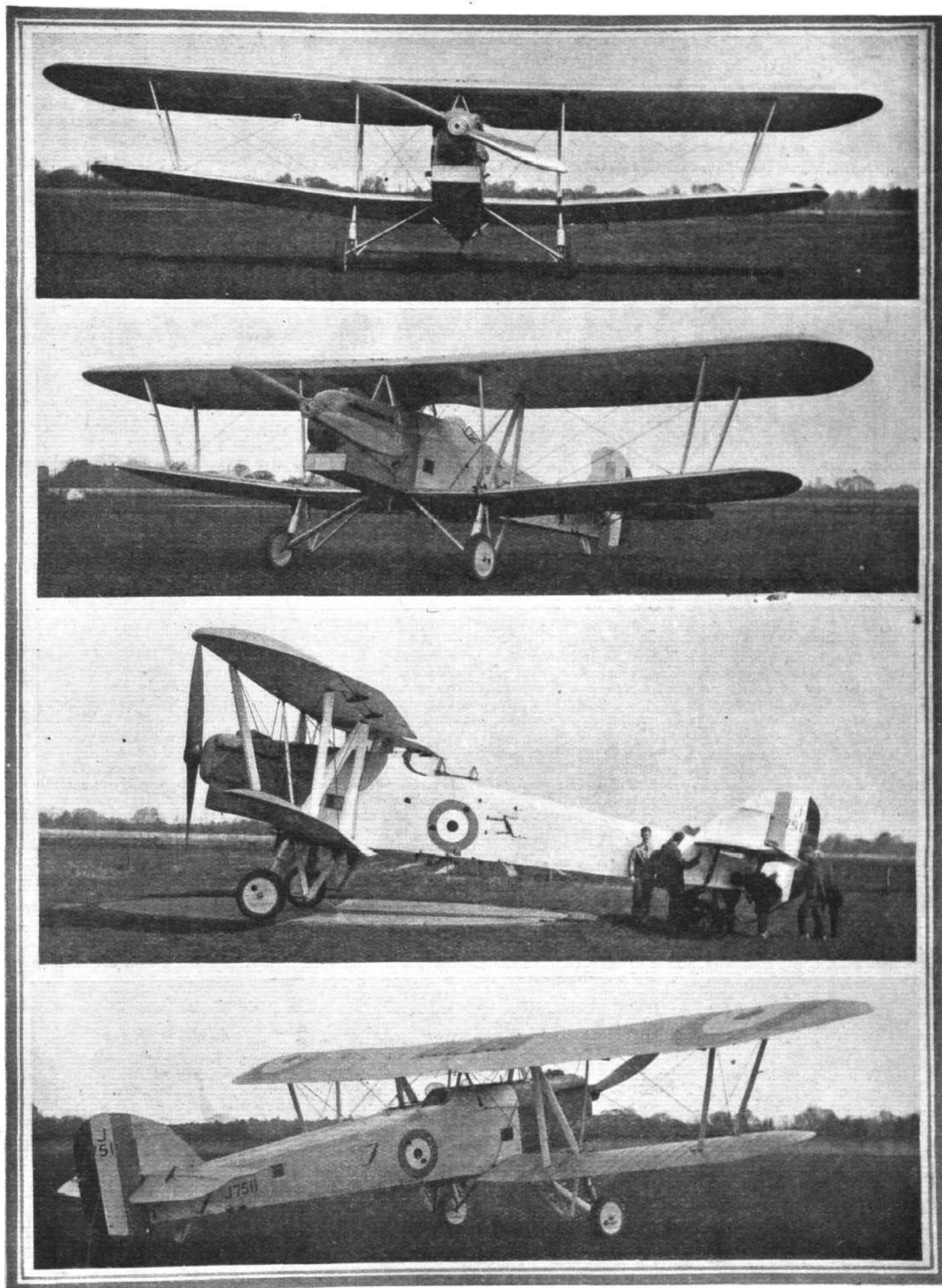
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✻ The Gloucester Aerodrome at Brockworth: It is probably not realised how extensive is the accommodation which the Gloucestershire Aircraft Co. has available at its aerodrome, situated a few miles out of Cheltenham. This photograph by Aerofilms, Ltd., gives an excellent idea of the vast shed accommodation and also includes a small portion of the aerodrome itself, and, in the background, some of the open country surrounding the aerodrome.

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A HAWKER DAY BOMBER: This photograph shows the Hawker "Horsley," with Rolls-Royce "Condor" engine, which is now going into production for the Royal Air Force. Several unusual features are disclosed by the photographs, but technical details of the machine may not yet be published.

THE DOUGLAS D.A.M.2 BIPLANE

An American Machine Designed For Air Mail Service

IN response to the invitation from the U.S. Post Office Department for 'planes specially designed for air service, to replace the D.H.4B machines at present employed, several of the well-known American aircraft constructors have produced machines meeting these requirements. Of these we have already published a description of the Curtiss "Carrier Pigeon" (FLIGHT, April 16, 1925), and this week we are able to give some brief particulars, and illustrations, of an air mail machine produced by the Douglas Company, of Santa Monica, California—the makers of the Douglas "World Cruisers" which made the flight round the world last year.

The Douglas "D.A.M.2," as this new mail 'plane is called, has already been tested by the U.S. Post Office Department,

of standard wood spar and built-up rib construction, both upper and lower surfaces being in two sections and set at a dihedral angle. The two top sections are joined together at their roots, so that the main spars are continuous. Instead of the central cabane usually employed on this type of machine for supporting the top planes on the fuselage, there are two pairs of "half-struts" extending from the sides of the fuselage to points on the wing spars some distance out. The lower wing sections are attached to short wing roots built integral with the fuselage, and the wings are made extra thick at their roots in order to receive the main petrol tanks. These tanks, it may be mentioned here, are so hung in the wing that they may be dropped at will by the pilot. This feature, added to



A front view of the Douglas "D.A.M.-2" mail 'plane, showing the thickened wing-roots on the lower plane where the petrol tanks are located.

and during these trials the machine showed an improvement in performance in three important characteristics as compared with requirements laid down in the tentative specifications. Thus, the pay load was 1,000 lbs., as against 800-900 lbs., the ceiling was increased from 17,000 to 17,500 ft., while a landing speed of 52 m.p.h. was attained instead of the 56 m.p.h. specified. This machine, in company with certain other makes of air mail 'planes, has been put into service on the air mail route in order that further data as to its qualities may be obtained under actual service conditions.

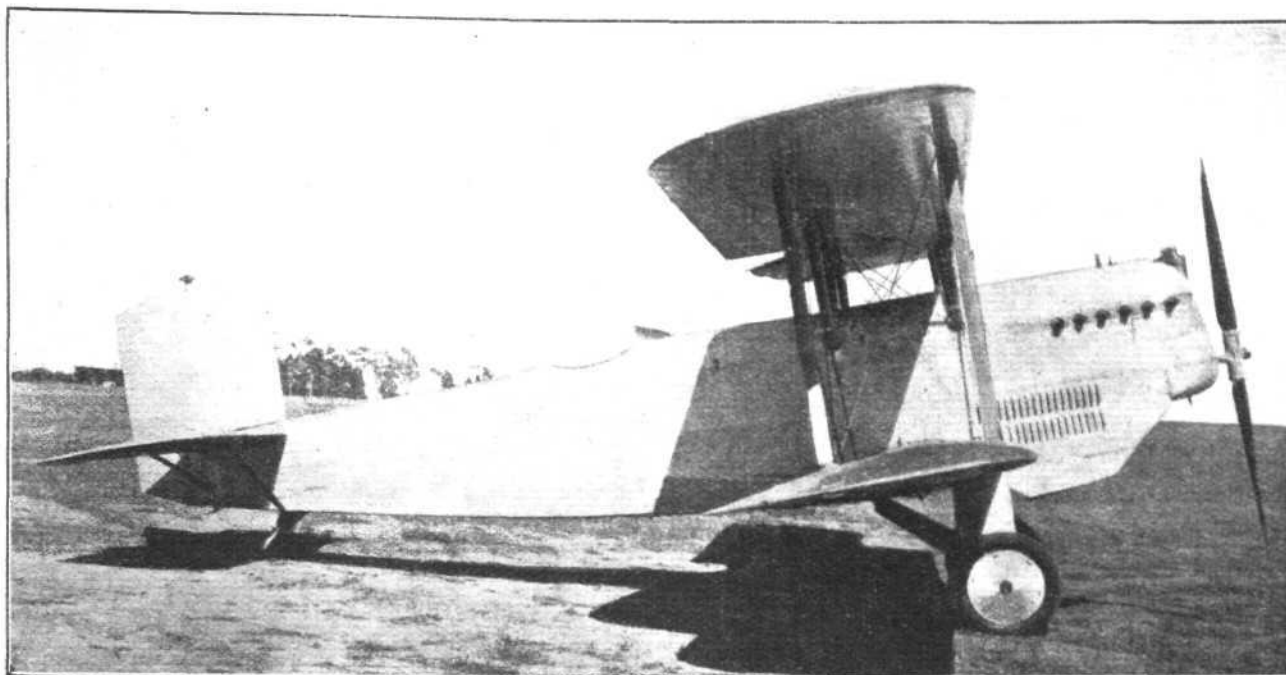
The "D.A.M.2" has been developed from the Douglas "XO-2" observation 'plane, which has recently been adopted by the U.S. Army Air Service as a standard design for this class, replacing the D.H. type machines hitherto employed. It is a single-bay, wire-braced tractor fuselage biplane, with a single 400 h.p. "Liberty 12" engine. The main planes are

the fact that they are located away from the pilot's cockpit, makes for greater safety in the event of a crash, reducing the risk of fire to a minimum. Each tank is made of sheet aluminium, and has a capacity of 60 gals.; a 10-gal. gravity tank is located in the upper right-hand wing. While on the subject of fuel tanks, it should be noted that if required an additional 40-gal. fuel tank can be installed in the fuselage, behind the engine compartment whereby the normal range (700 miles) of the machine may be increased to about 900 miles.

External wing bracing is by streamline wires and one pair of interplane struts each side of the fuselage. Unbalanced ailerons are fitted to both upper and lower planes. The fixed horizontal and vertical tail surfaces are of standard wood spar and built-up rib construction, while the elevators and rudder are constructed of duralumin tubing. All surfaces are fabric-covered.



THE DOUGLAS "D.A.M.-2" MAIL 'PLANE: A three-quarter front view of one of the recent machines produced in America for air mail service.



THE DOUGLAS "D.A.M.-2" MAIL PLANE. Side view. A 400 h.p. "Liberty-12" engine is installed.

The fuselage is divided into two sections, the forward engine unit and the main body carrying the wings, chassis, pilot, etc. It is a wire-trussed tubular steel structure of rectangular cross-section, the engine unit is constructed of chrome molybdenum steel, the same material together with carbon steel tubing being employed for the rest of the fuselage. Welding and brazing are employed on steel parts. The engine section is detachable, allowing for interchangeability of power plants, and is separated from the main body by an asbestos-faced aluminium fire wall.

A cargo space of 55 cub. ft. is provided in the first and second bays to the rear of the engine section, and if required an open cockpit, seating four passengers, may be provided at this part of the fuselage. The pilot's cockpit is located aft of the main planes, and additional cargo space, of about 12 cub. ft., is provided under the floor of this cockpit.

A wide axle-less landing chassis is fitted, consisting of two tripods of steel, the outer members of which being attached to the wing-stumps, while the inner members are hinged to the bottom of the fuselage. The outer chassis members, in which the shock absorber system is built up, are detachable in order to facilitate rewinding the elastic cord. The wheel track is 8 ft. 8 ins. A tail skid of steel tube, interconnected with the rudder, is fitted.

The engine radiator is of "U"-shape, cartridge type construction, mounted below the engine, just in front of the

leading edge of the lower plane. It is provided with flat type shutters so arranged that when they are closed they form a streamline section with the nose of the fuselage.

The principal characteristics of the "D.A.M.2" are:—

Span (approx.)	..	..	41 ft. 6 ins.
Chord	..	..	5 ft. 8 ins.
Gap	..	..	6 ft.
Total wing area	..	..	411 sq. ft.
Area of tail plane	..	..	35 sq. ft.
Area of fin	..	..	7 sq. ft.
Area of rudder	..	..	10.35 sq. ft.
Area of elevators	..	..	20 sq. ft.
Area of ailerons (4)	..	..	50 sq. ft.
Angle of incidence (top and bottom)	..	..	0°
Dihedral	..	..	2°
Wing section	..	..	Clark "Y."
Weight, empty	..	..	2,500 lbs.
Weight, laden	..	..	4,300 lbs.
Pay-load	..	..	1,000 lbs.
Weight per sq. ft.	..	..	10.5 lbs.
Weight per h.p.	..	..	10.75 lbs.
Speed range	..	..	52-145 m.p.h.
Ceiling, full load	..	..	17,500 ft.
Range of action	..	..	700 miles
Safety factor	..	..	8

London-Cape Town Survey Flight

At last Mr. Alan Cobham has been able to resume his journey en route for Cape Town. On December 6, he, together with Mr. Elliott (engineer) and Mr. Emmott (cinematographer), set out from Athens at noon on the D.H.50J (Siddeley-"Jaguar"), and flying 450 miles across the Mediterranean, via Crete, arrived at Sollum (on the Egyptian coast) at 2 p.m. Shortly after noon the next day they arrived at the R.A.F. Aerodrome at Heliopolis (Cairo), where a halt will be made for a few days.

The U.S. Air Inquiry

THE report, just issued, of the special Aircraft Board appointed by President Coolidge—following the loss of the "Shenandoah" and Col. Mitchell's allegations—to inquire into the condition of American aviation, is, on the whole, a very tame affair. Its general tone is of the "middle course" variety, although it finds unanimously that there is no justification for the charges that the country's aerial defence is inefficient and inadequate. Nevertheless, it admits there is room for improvement in the air service, and recommends the appointment of Assistant Secretaries of War, Navy, and Commerce to supervise the development of aviation. It is, however, opposed to the creation of a Department of National Defence, or of a separate Air Ministry with control over all aviation problems. It recommends that aviation should be specially represented on the Army General Staff and in the

office of the Chief of Naval Operations; that the "Army Air Service" should be known as the "Army Air Corps" and should be given two additional brigadier-generals. It further recommends the conferring of temporary rank upon air officers—with continued flight pay commensurate with the work assigned to them; the encouragement of private aircraft building, and the elimination, wherever possible, of Government competition; and the provision of Government aid to commercial aviation by the establishment of airways and air mails.

Roland Garros Memorial

A MEMORIAL to Roland Garros, one of France's most famous aviators, was unveiled on December 3 in the Champs-Élysées. It took the form of a life-sized statue of Garros, in flying kit and leaning on a propeller, bearing the inscription, by Jean Cocteau, "He scorned death—Death loved him." Later, the memorial is to be transferred to the island of Réunion, where Garros was born in 1888.

German Air Restrictions

FOLLOWING on the signing of the Locarno Pact, an important conference, or series of conferences, will be held for the purpose of reviewing and possibly modifying the "nine rules" laid down in the Versailles Treaty regarding aviation in Germany.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

SPECIAL GENERAL MEETING

NOTICE is hereby given that a Special General Meeting of the Club has been convened by direction of the Committee pursuant to Rule 33, and such Meeting will be held at the Club premises, 3, Clifford Street, London, W.1, on Wednesday, December 16th, 1925, at 6 p.m.

Agenda

To make the following alterations in Rule 50, as indicated in heavy type:—

The subscription for Members for the year 1926 and thereafter shall be **£6 6s.** per annum and for Lady Members **£2 2s.** per annum, or such other sum as may

be decided upon in General Meeting, and the Entrance Fee such sum as the Committee may from time to time determine.

The subscription for Members who are officers serving in the Royal Air Force or the Royal Air Force Reserve, or Officers (past and present) engaged in the Air Ministry Departments, or Naval and Military Officers attached to the Royal Air Force for service, shall be **£3 3s.** per annum.

Offices: THE ROYAL AERO CLUB,

3, CLIFFORD STREET, LONDON, W. 1.

H. E. PERRIN, Secretary

LIGHT 'PLANE CLUB DOINGS

London Aeroplane Club

OWING to the fog there was practically only one day's flying during the week, i.e., Monday, November 30th, 1925.

The total flying time for the week was 7 hours 50 minutes.

The following Members had flying instruction:—Miss O'Brien, R. C. Brighten, Sir John Rhodes, Col. Turner, A. R. Ogston, W. Hay, R. V. Banks, A. Lees, R. Malcolm, S. O. Bradshaw, J. S. M. Michie.

The following Members flew solo:—N. J. Hulbert, Col. Turner.

The Members have formed a Dance Committee and an Inaugural Dance will be held at the Suffolk Galleries, Suffolk Street, W.1, on Wednesday, January 13th, 1926, under the patronage of Sir Philip Sassoon, the Under-Secretary of State for Air. Tickets 10s. 6d. including Buffet Refreshments. Tickets may be obtained from Capt. F. G. M. Sparks, at Stag Lane Aerodrome, Secretary, Royal Aero Club, 3, Clifford Street, London, W.1, or the Hon. Sec. Dance Committee, Mrs. Elliott-Lynn, Ladies Athenæum Club, 19, Stratford Place, W.1. The proceeds will be devoted to the furnishing of a Clubhouse on the Aerodrome.

Lancashire Aero Club

THROUGHOUT the week weather conditions have been bad. Hard frost, accompanied by fog, made flying out of the question until Friday.

Last week-end, too late for inclusion in last week's report, Mr. H. Stern turned L.R. on its back. This occurred in attempting to take off "up the hill," and was due to a burst tyre occasioned by the bad state of the frozen ground. The machine turned over very gently and the damage was even less than to L.V. a week or two ago.

The uncharitable suggest that Mr. Stern's bad luck was due to the fact that he was attired in a common, or garden, lounge suit instead of one of his golf-cum-ping-pong outfits that we have come to love so well, whilst another theory is that a well-known householder of the adjacent "desirable resident of neighbourhood" of Bramhall spends his evenings besprinkling the aerodrome with "Keatings" resulting in the aforementioned havoc among the moths.

On Friday the fog lifted long enough for Mr. Cantrill to test L.V. which had been waiting some days after the recent repairs.

On Saturday and Sunday a little dual was possible, Messrs. Cantrill and Scholes taking the following:

Messrs. Goodyear, Hardy, Hope, Annable, Williams, Wilkinson, Parker, Colley, McNair. Messrs. Goodyear and Lacayo did short solo flights. Total flying time was 5½ hours.

The repairs to L.R. are only likely to take a few days after which we hope to be free from crashery for a time, feeling that we have had our ration.

Like foot-and-mouth disease, the "Hush-hush" spirit is always with us and there is considerable mystery attached to the chairman's visit to town this week-end. In accordance with the best hush-hush principles, the full details will no doubt leak out before next week.

The Newcastle-upon-Tyne Aero Club

FLYING report for week ending December 6, 1925:—

Total flying time—G—EBLX, 9 hrs. 4 mins.; G—EBLY, 7 hrs. 4 mins.; = 16 hrs. 8 mins.

Dual flying under Major Packman:—Messrs. J. Bell (30 mins.), J. M. Campbell (32 mins.), J. D. Irving (4 hrs. 49 mins.), C. B. Marshall (30 mins.), L. Smith (30 mins.), R. N. Thompson (65 mins.), G. H. Twine (30 mins.), W. T. Walton (1 hr. 15 mins.), J. Wingate (30 mins.).

The following flew solo:—P. F. Heppell (53 mins.), W. H. MacKay (2 hrs. 23 mins.), R. N. Thompson (45 mins.).

Mr. W. T. Walton had a 17 mins. joy ride with Maj. Packman on Thursday and straightaway took 45 mins. instruction, followed by a further 30 mins. on Saturday.

Mr. Baxter Ellis flew for 17 mins. on Saturday with Mr. Hudson as passenger, and on Sunday for 30 mins., each with Mrs. Baxter Ellis and Mr. W. H. Leete. Maj. Packman took up for passenger flights on Sunday Miss Jeffrey and Mr. Lackerby, each 15 mins.

Mr. R. N. Thompson made his first solo flight on Thursday. He performed exceedingly well on this and two later flights. On landing from what was, unknown to him, his last dual flight, he observed Maj. Packman, who is slightly over the 6-ft. mark and proportionately built, curling himself up in order to be able to leave the front cockpit (from which he gives instruction always); and, thinking that he was finished flying for the day, he also (Mr. Thompson), being of considerably smaller dimensions than Maj. Packman and very nimble, climbed out, and was proceeding towards the hangar when he was recalled and told he was "launched." This is a particularly amusing incident when it is known that Mr. Thompson has been one of the greatest enthusiasts in the Club from the beginning, and has frequently expressed the hope that he would soon be flying alone. He did not hesitate when he knew the position. He was instructed to "get well up," and, having carried out these instructions without troubling about other matters for some time, he looked below, and came to the conclusion that he had left the planet altogether. Mr. Thompson is one of the members (Mr. Heppell is the other) who undertook to repair, decorate, and furnish the club-house at their own expense. He is also an active member of the committee, and his achievements as a pilot have brought forth sincere congratulations from all members of the club.

Mr. R. M. Stobie has now received his Royal Aero Club licence.

The weather has been bad throughout the week, but flying has taken place each day except Monday.

It is very satisfactory that the club has been able to demonstrate that flying by a civilian club can be carried out throughout the year, and will, it is considered, have the effect of establishing confidence locally, where the limitations of aircraft are exaggerated in the public mind. New members are joining now and taking up their training right away. It appears that the Club has been justified in carrying on as if the machines had been received in the summer instead of the winter (though, of course, a larger membership would have resulted immediately had the weather been better), and in

carrying out the stipulations of the Air Council as regards having a permanent instructor and engineer. The result has been that members may go up at any time to the aerodrome and be sure of a turn, so long as weather conditions allow. There is already keen competition to obtain pilot's licences. We may not suffer greater financial difficulties through adopting a bold policy.

Whist drives will be held in the club-house on Wednesday, the 16th inst., and Wednesday, January 13, at 7 p.m. A charge of 1s. will be made.

Particulars as to membership will be sent on receipt of application to the Secretary, at 61, Quayside, Newcastle, and to which address all communications should, for the present, be sent.

AIR FIGHTING

The Strategy and Tactics of Air Fighting. By Major Oliver Stewart, M.C., A.F.C., with introduction by Wing-Commander W. G. Barker, V.C., D.S.O., M.C., A.D.C., Royal Canadian Air Force. With diagrams by Mr. Leonard Bridgeman. Longmans, Green & Co. 6s.

THE air has come to occupy a very unusual place in popular interest, especially when one remembers how only four or five years ago, no newspaper would condescend to publish anything concerning it. Now it has won recognition in *Punch* as a topic with which the British citizen concerns himself, than which no better testimonial could be desired. This is perhaps all the more remarkable because the submarine, which might be called the opposite number to the aeroplane, is very much in popular disfavour, being regarded as useless for commerce, and not likely to be very effective in war. This unique position won by the aeroplane is doubtless the cause why Messrs. Longmans, Green & Co. have just published from the pen of Major Oliver Stewart, a book of a most unusual character, being in essence a manual of air fighting. Probably in old days there were books on fencing, describing how to parry in tierce, &c., but duelling then was an ordinary occupation of a gentleman. One can hardly imagine any publisher now-a-days bringing out a book on, say, bayonet fighting, or the tactics of mountain warfare, at a price of 6s. a copy. Yet this book of Major Stewart's, which, is in the main a list of instructions as to how a pilot should throw his aeroplane about when engaged in aerial combat, has been so published. It is really a remarkable occurrence.

Apart from the fact that interest in all that concerns the air is rapidly on the increase, especially among the rising generation, Major Stewart's clear and interesting treatment of his subject is sufficient justification for the enterprise of his publishers. As he writes himself, the great air fighters were mostly not vocal, and the public which worships the names of Ball, Guynemer, and others, has been left in ignorance as to why they were so mighty in the battle. Major Stewart, himself a very gallant and accomplished pilot of fighter aeroplanes, is also a more than competent writer, and he has the gift of making himself interesting even when subjecting his subject to an analysis as careful and thorough as is practised in a chemical laboratory. What other experienced fighting pilots will say about his theories remains to be seen, but to the layman he appears in almost all cases to make his point without any possibility of contradiction. Probably, no one will take serious exception to his two most emphatic dicta, namely, that height is of supreme importance and that even when trying to escape a pilot should always climb and never dive; and that quality of aircraft is far more important than quantity.

But a review would be a dull and not very useful affair if it merely recited a string of extracts to which praise can be given. Its main service to the reading public, and possibly to the author, is to discuss controversial points in a book. In this book not many such points can be found; but to begin with it may be remarked that the author's use of the word "strategy," which he defends in a whole page of his preface, is not universally accepted. He admits that he knows the true meaning of the word, but decides to apply it to the phase when the machines are in the air, but far distant from each other, and he asks: "If the two phases of war in the air: when the machines are far distant from one another and when they are close together, are not to be known as strategy and tactics, by what suitable terms are they to be known?" The answer is "Grand tactics and Minor tactics." Another

point which is controversial, but which may be left for the Air Staff to controvert, if it will, is the contention that in peace time no advance can be made on the lessons in tactics of the great war.

Naturally, Major Stewart lays himself most open to criticism when he gets away from his own special subject of actual combat in the air. When writing of airships in war, he appears not to have studied the views of the best airship officers, and consequently he sets to work to demolish claims which have not been set up, at least in those quarters. Probably, no airship man seriously believes that airships as we know them now will take part in land warfare. Their sphere is to be patrolling of the ocean trade routes, and their quarries will be raiders like the *Emden*; it being axiomatic that the British Navy will forbid the surface of the sea to hostile carriers, so that the airships will never be subject to attack from aeroplanes, unless the latter have been released from another airship. Major Stewart also says that heavy oil fuel is in many circumstances more readily set on fire than petrol. Petrol is not very readily set on fire, but petrol fumes are highly inflammable and have caused the destruction of many airships. Heavy oil does not give off those fumes.

It is notable that Major Stewart, in common with most writers and speakers on aerial warfare, believes that aircraft will be used to strike at civilian populations. At the same time he mentions that pilots shrink from loading their belts with explosive bullets, as they do not wish to cause unnecessary suffering to their opponents. Mr. J. M. Spaight, in his book, *Air Power and War Rights*, pointed out the contradiction between those two frames of mind, and hoped that the reawakened sense of chivalry which has accompanied air fighting would mitigate the horrors of the future use of aircraft. He also believed that no combatant would be eager to resort to "frightfulness," or striking at nerve-centres, as it is now called, for the simple reason that two can play at that game, and the retribution would come so hard upon the heels of the first offence. We can only hope that Mr. Spaight is right and Major Stewart and the others wrong.

One would like to hear the views of an artillery expert on the chances of the future big gun carried on an aeroplane. Major Stewart writes, it is interesting to note, that bombing, "even with the best sights and under the best conditions, is grossly inaccurate." But why should the aircraft big gun be more accurate? In his Appendix Major Stewart plunges boldly into the realm of prophecy, and this fanciful chapter is in great contrast to the calm, complete analysis of fact which forms the bulk of the volume. Frankly, Major Stewart is far from at his best in his pictures of the battle of the future, when his fighters "scale to the freezing, stone-hard blue of the great altitudes," and plunge to the attack "in one breathless drop" amid the "yell from many whip-lash guns." The two styles do not go well together. But it is not so much a prophecy as an opinion, and a very interesting one, that absolute air supremacy, such as we Allies failed to achieve on the Western front in the Great War, is not impossible of attainment. He rightly adds that air supremacy is victory. Great Britain, he holds, by using the talent which she possesses, can achieve a complete and overwhelming air supremacy, and then "if we really do not want another war we can easily prevent one from occurring." This passage is good enough to give a new lease of life to the once accepted but now somewhat discredited maxim, "Si vis pacem, para bellum."

F. A. de V. R.

Another Round the World Flight

ANOTHER round the world flight is being planned for 1926. This is more or less an international affair, for the pilot, Commandant Franco, is Italian, while the machine will be a German Dornier flying-boat fitted with British Napier

"Lion" engines. The start will be made from Seville (or, actually, from Melilla), and the route will include Cape Verde, Pernambuco, and Buenos Aires. Commandant Franco will be accompanied by Capt. Ruiz Alda and a mechanic.

AERONAUTICAL RESEARCH COMMITTEE REPORTS

FROM the number of enquiries we receive it appears that there is a desire in aircraft circles to know approximately the contents of the various technical publications of the Aeronautical Research Committee. All the aircraft firms probably receive these reports regularly, whether or not they contain anything of immediate interest or utility. In the case of draughtsmen, however, and others interested in aeronautics, who can hardly be expected to purchase all the reports, the problem of deciding whether any publication interests him is often a difficult one. As it is obviously desirable that the knowledge of aeronautics should be made available to all who take an interest in the subject, we have arranged with the Air Ministry to publish in **FLIGHT** summaries of all the technical publications as soon as these are issued, or shortly before they are published. All A.R.C. publications can be purchased from H.M. Stationery Offices at Adastral House, Kingsway, London, W.C.2; 28, Abingdon Street, London, S.W.1; York Street, Manchester; 1, St. Andrew's Crescent, Cardiff; 120, George Street, Edinburgh, and through any bookseller.

An Experimental Study of the Vibrations in the Blades and Shaft of an Airscrew. By A. Fage, A.R.C.Sc. R. and M., No. 967. (Ae. 183.) (16 pages and 11 diagrams.) September, 1925.

The problem of determining the flexural vibrations in the blades and shaft of an airscrew is similar to the well known engineering problem of vibrations in shafts. This work was put in hand, however, for a widely different purpose, viz. to reduce the sound in the cabin in a commercial aeroplane much of which is due to the noise emanating from the airscrew.

The frequencies of the flexural vibrations in the blades and shaft of a rotating airscrew have been determined from an analysis of the sounds emitted, and a comparison of experimental results with those of theory is given. The experiments were made on four airscrews of different blade shape, the variables of design being width and geometrical pitch.

The analysis was made with Tucker hot-wire microphones* used in conjunction with a four-valve amplifier. To isolate extraneous noises the electric motor driving the airscrew was enclosed in a sound-proof chamber, and a flexible drive was used between the motor and airscrew shafts.

The sounds of rotation were analysed and found to be compounded of a large number of harmonics, having as fundamental a note of frequency equal to the product of the number of blades and the rotational speed.

The measured frequencies of the shaft vibrations were found to agree very closely with the calculated results, except for a discrepancy of 8 per cent. obtained with the heaviest airscrew.

The experiments on blade vibration support the approximate formula of Southwell and Gough,† viz., $p^2 = p_0^2 + a\omega^2$, where p_0 is the frequency of the gravest mode of vibration in the absence of rotation, and a is a constant. Close agreement between the theoretical and experimental values of both p_0 and a was obtained on long narrow blades; the agreement was less satisfactory for the widest blade of the series.

The Lateral Control of a Biplane by Combined Use of Ailerons and Varying Leading Edge Slots. By G. P. Douglas, D.Sc., F. B. Bradfield, Math. and Nat. Sci. Trip., and A. S. Hartshorn, B.Sc. R. and M., No. 973. (Ae. 188.) (14 pages and 13 diagrams.) April, 1925. 1s. net.

The control of aeroplanes at low speeds has been the subject of considerable full-scale and model experiment under the direction of the Stability and Control Panel of the Aeronautical Research Committee, and recently attention has been paid to the slot-and-aileron control. The early model work on this control has been reported in R. and M. No. 916,‡ and full-scale flight tests in R. and M., No. 968.§

The determination of the efficiency of the slot-and-aileron control is made from measurements of the rolling and yawing moments due to the slot used in conjunction with balanced ailerons on the wing. These moments were measured for

* "A Selective Hot-Wire Microphone." *Phil. Trans. Roy. Soc.*, Series A. Vol. 221.

† "On the Free Transverse Vibrations of Airscrew Blades." R. V. Southwell and B. S. Gough. R. and M. 766.

‡ R. and M. 916. "Slot Control on an Avro with Standard and Balanced Ailerons." By F. B. Bradfield.

§ R. and M. 968. "Full-scale Tests on a New Slot and Aileron Lateral Control." By H. L. Stevens.

*Plane-Launching Tests with R.33

ON December 4 the rigid airship R.33 made a short flight over Pulham, during which some further tests were carried out with the experiment of launching, and "hooking-on" a D.H.53 from and to the airship. Maj. G. H. Scott was in charge, and this time Squad-Ldr. "Rollover" Haig succeeded in accomplishing the two manœuvres. When the

the combination of aileron angles and slot widths as recommended in R. and M., No. 916, for full-scale tests. The incidence range was from 6° to 39°.

The results previously found for the monoplane are confirmed for the biplane at zero rate of roll. There is a very powerful rolling control available to stop rolling at and above stalling, though when used to assist a roll it is not so large. Yawing moments are decreased by the slot, and in some cases reversed in sign.

The full-scale tests of an Avro with this type of combined slot and aileron control are in progress (see R. and M., No. 968.)

Model Drogue Experiments. By G. S. Baker, O.B.E., late R.C.N.C., M.Inst.C.E. R. and M., No. 425. (12 pages and 8 diagrams.) April, 1918. 9d. net.

Drogues may be briefly described as sea anchors, and the present model experiments may have a wider application than as sea anchors for airships for which they were originally designed and are suitable.

The drogues tested were of two forms, one being a type of canvas bucket with a hole in the bottom, and the other a flat disc type suitably loaded. The drogues were towed by bridle on the end of a tow line attached to apparatus fitted to the experimental carriage running over the William Froude National Tank.

The tests may be divided into two different classes—surface or above water towing, and submerged towing. In the former case the drogue was shackled to a wire 16 ft. in length attached to a travelling carriage 8 ft. above the water surface. The general behaviour of the drogue when towed was noted at a number of speeds and the pulls measured in certain cases.

Certain difficulties were experienced due to oscillation of the drogue when towed, but these were overcome. Certain flat types of drogue normally employed for mine sweeping purposes were also tested.

Autorotation Measurements on a Model Aeroplane with Zero Stagger. By F. B. Bradfield and L. P. Coombes, B.Sc. Presented by the Director of Scientific Research. R. and M., No. 975. (Ae. 189.) (7 pages and 4 diagrams.) April, 1925. 6d. net.

The spinning of aeroplanes is a manœuvre which has attracted much attention, but associated with it are certain dangers which have been made the subject of investigation. One method of ascertaining the behaviour of an aeroplane in a spin is to carry out wind tunnel experiments using models which, when supported in an appropriate manner, will rotate freely in the wind. These experiments are called autorotation experiments.

The present report is a continuation of R. and M., No. 965, "Pitching and Yawing Moments with Sideslip on a Model Aeroplane with Zero Stagger." by F. B. Bradfield, and gives the measurements of autorotation rates on a model up to 52° incidence. An investigation of the cause of the high rates found has been attempted.

Autorotation commenced at 17° and continued to beyond 52° incidence. The curve was then flattening off. A ps/V of 0.74 was reached. The large range and rates of autorotation seem to depend on the biplane arrangement rather than on any peculiarity of the wing section.

airship was several thousand feet up Squad-Ldr. Haig took his seat in the light 'plane suspended below the hull of the airship, and "let go." After diving a short distance the Bristol "Cherub" started up without difficulty, and then, returning to the airship, Squad-Ldr. Haig made contact with the trapeze and his machine, which was thus once again attached to the airship.

THE CONTROL OF STALLED AEROPLANES

A PAPER on above subject was read by Professor Melvill Jones before the Royal Aeronautical Society on December 3, but he did not go into great technical detail concerning the problems of control of stalled aeroplanes. Rather was it confined to the outstanding results of research and the probable reaction of these results on practical aeronautics. Professor Melvill Jones is an independent member of the Air Research Committee, and has been serving for some years on the Panel appointed by this Committee to co-ordinate research upon the control and stability of aeroplanes. The lecturer pointed out that these researches have now reached a stage when a comprehensive report dealing with the results that have been achieved can be issued, and this report, R. and M., No. 1000, has gone to Press, if it has not actually been issued. Those who wish to go into greater detail are therefore referred to the official report, which we understand will be published shortly. In the meantime a brief summary of the conclusions at which Professor Melvill Jones arrived may be of interest.

The lecturer stated that the bulk of the aeroplanes flying today were not yet satisfactory as regards control in the stalled state, and pointed out that improvement of control after stalling is not alone sufficient to make the carrying of passengers by air a reasonably safe proceeding, unless it is accompanied by some effective limitation of the magnitude of the stalling speed itself. In this connection we think the following sentence from Professor Melvill Jones' paper deserves to be quoted, and in order that it shall not be overlooked it is given below in italics. "If," Professor Melvill Jones said, "improvement in control in this respect is immediately to be used as a reason for allowing stalling speeds to rise, the situation will be little, if at all, improved, and I desire to state, as emphatically as I am able, the opinion that the mastery of the problem of stalled control in no wise affects the necessity for limiting, by regulation, the stalling speed of aircraft carrying passengers for hire."

To cause an aeroplane to be thoroughly controllable when stalled, the lecturer gave the following two statements which he considered sufficiently simple and general to be elevated to the exalted rank of "rule of thumb": 1, to provide ailerons which can exert a sufficient moment about an axis passing through the centre of gravity of the aeroplane, inclined through a sufficient angle downwards and forwards from the mean chord of the wings. 2, to provide a rudder of sufficient power.

The lecturer pointed out that compliance with either of these rules resulted in an aeroplane which could be kept fairly well upon an even keel when stalled. A machine in which the deadly incipient spin need never be allowed to occur. Compliance with both rules was, however, necessary to obtain a good positive lateral control under all conditions.

Before referring in detail to the types of ailerons and rudders which would give that controllability which was required to prevent a machine from accidentally commencing a spin, Professor Melvill Jones defined the moment coefficient of the control surfaces as a number defining the relative moment exerted by different controls after allowance had been made for variations in air density, size, and velocity, of the aircraft. Its precise definition was:— $1,000 \times \text{Moment} / \rho V^2 S s$, where ρ is the air density, V , the velocity of the aeroplane, S , the area of the wings, s , the semi-span of the wings. The same coefficient was used later to express rudder power.

Concerning the conventional type of ailerons, the lecturer said that on a stalled wing these exerted their moment about an axis inclined upwards and forward through angles between 15 deg. and 30 deg. from the wing chord, the maximum moment which they could exert being represented by a coefficient of about 20, the coefficient being that defined above. This type of control was practically useless. At the other end of the scale was the Handley Page leading-edge slots combined with a balanced aileron of the type known as the "Bristol-Frise," which produced a moment for which the coefficient was 35, about an axis inclined downwards and forwards through some 10 deg. to 15 deg. from the wing chord. When applied to its extreme limit this device would produce a moment coefficient of 60, about an axis roughly parallel to the wing chord.

Turning to the subject of sufficient rudder power, Professor Melvill Jones stated that the first point to notice was that a powerful rudder was not required so much to cause the aeroplane to yaw as to prevent it from yawing in an undesirable direction. An essential feature of the incipient spin was that it consisted of a combined roll and yaw. If this yawing motion could be checked, or reversed, by the use of the rudder the incipient spin could be stopped.

Wind tunnel tests upon the effect of rolling had shown that no wing yet tested had shown a coefficient of yawing moment much greater than 10, while for normal thin wings the maximum coefficient was of the order of 8 or 9. It followed that a rudder which would produce on a stalled aeroplane of this type a yawing moment of coefficient greater than 10 would be able to deal with the moment generated by the wings. A slide was shown giving curves of powers of rudders of various aeroplanes. These curves showed a universal falling off in rudder power on stalling, due to the rudder becoming shielded from the relative wind by the body and elevators. The reduction of rudder power was much greater for small rudders than for large ones. The interesting region, from the point of view of the controlled stall, was found to lie between 20° and 30° incidence of the main wings, and here the effective rudder power of most of the aeroplanes tested was much less than the coefficient of 10, which was considered the minimum desirable. The only standard aeroplane which approached these requirements was the S.E.5.

Various fin and rudder combinations and positions, taken from R. & M. 965, were shown, and illustrated the shielding of the rudder at large angles of incidence, and it was found that an arrangement in which the fin and rudder, of small area and low height, were placed wholly above the fuselage was very bad in this respect, whereas a large rudder, tall and narrow, placed behind the stern post and projecting slightly below, as well as above the fuselage, gave maximum rudder power. The lecturer pointed out that the power of the rudder depended upon its own area and that of the fin in front of it, and upon the distance of those areas behind the centre of gravity of the aeroplane. For convenience in comparing these quantities the rudder volume formula was employed, which is usually written $S'' l'' / S s$, in which S'' is the combined area of fin and rudder, l'' the distance of the centre of this area from the centre of gravity of the aeroplane, and S the wing area, s , the semi-span of the main planes. The lecturer pointed out that in the majority of aeroplanes l'' was not very different from s , so that the rudder volume was approximately the ratio of rudder and fin area to wing area. The lecturer suggested that as a good average it could be assumed that from a rudder having a volume of 0.05, a moment of coefficient at least 7 should be attainable when the rudder was moved through 20° from the neutral position. As the moment given by a rudder was nearly proportional to the angle up to at least 30°, it would appear practicable to lay down the rough generalisation that a well-designed and placed fin and rudder, having a volume not less than 0.05, should give a moment of coefficient 10.

This applied to the conventional British biplane and thin wing section only, and other wing combinations might call for different rudder powers. If, as happens in many machines, the distance of the fin and rudder behind the centre of gravity was approximately equal to the semi-span of the wings, this reduced to the very simple rule: fin plus rudder area equals 5 per cent. of the area of the wings.

In conclusion, the lecturer summarised the situation as follows: "The majority of fatal flying accidents in the past have been rendered fatal by the incipient spin following an accidental stall near the ground. The reason for this spin and the pilot's failure to check it are thoroughly understood, and two independent ways of enabling him to check it are known. These are (1) a rudder somewhat larger than has been usual in the past, and (2) a special form of wing tip control. If both these modifications are adopted, stalled aeroplanes become, in many respects, as controllable as aeroplanes in normal flight."

Royal Air Force Memorial Fund

THE usual Meeting of the Grants Sub-Committee of the above Fund was held at Iddesleigh House, on November 26. Lieut.-Commander H. E. Perrin was in the Chair, and the

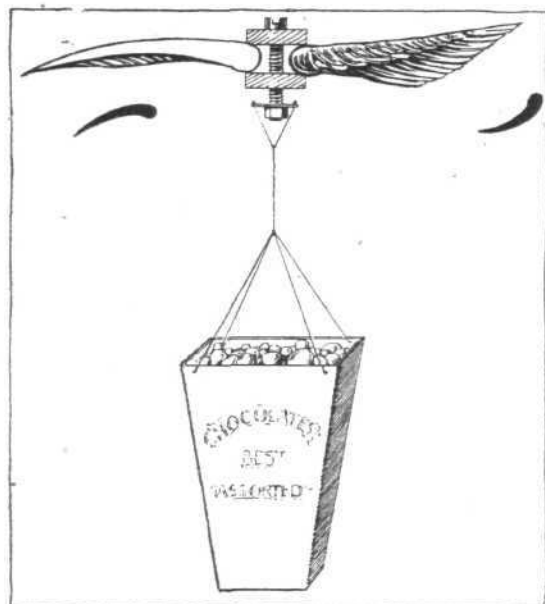
other Members of the Committee present were:—Mrs. L. M. K. Pratt-Barlow, O.B.E., Mr. W. S. Field. The Committee considered in all 14 cases, and made Grants to the amount of £205 17s. 7d.

CORRESPONDENCE

The Editor does not hold himself responsible for opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication must in all cases accompany letters intended for insertion in these columns.

ROTATING WINGS

[2105] I have just read the account of the first trials of the auto-giro, and upon reading the principles of the lifting vanes I was reminded of an experiment with a pair of sparrow's wings which I, and two other airmen, carried out at Howden Airship Base in 1921. Having found the wings while out walking, we decided to experiment with them and took them back to camp. I obtained a brass clamp and fastened the wings together with one reversed, one wing being at a positive angle and the other negative. A piece of wire was then twisted round the clamp, and to the end of this I attached a $\frac{1}{4}$ -lb. chocolate box and half-filled it with small pebbles. We then went to the hangar known as the "Twin-rigid" shed (which was, I believe, over 200 ft. high), taking with us a scale-model parachute of about 12 ins. in diameter. My two friends then climbed to the cat-walk under the roof, while I stayed below to observe results. The weighted wings and parachute were then dropped simultaneously, the parachute opening at once, and the wings starting to revolve as soon as released. The parachute drifted a little, but the wings descended absolutely



vertically, and touched the ground four seconds after the parachute. I again put more pebbles into the box and the experiment was tried again. This time the wings were even slower than before in "grounding," although they appeared to be revolving faster. I repeatedly added pebbles till the box was full, yet at no time did the wings touch ground before the parachute except when one of the strings tore out of the box owing to the weight. This threw the wings off their balance, so that they did a sort of vertical bank and stopped revolving. I think that had Mr. Courtney throttled "right back," he would have made a perfectly vertical descent, unless the larger keel surface aft of the supporting pillar interferes with the balance in such a descent. Do you think that the same wing-formation, driven in the opposite direction it takes in descent, would give as powerful a lift as it did in our experiment, as an air brake? I must apologise for wasting your precious time, but I write this in the hope that it may interest you.
R.A.F., Helwan.

L.-A.-C. BAILEY

THE SCHNEIDER CUP PROPELLERS

[2106] At the risk of prolonging a correspondence which must be becoming tiresome to your readers I am obliged to notice the letter from Mr. Longden in your latest issue, and to put forward our reply.

In view of the fact that the power was developed at very high revolutions per minute, the propeller design was in any case extremely difficult and, moreover, the particulars

supplied by the Gloucester Company proved incorrect, the horse-power of the engine being exceeded and the machine failing to develop the quoted speed. The propeller in these circumstances naturally required modifications, and following the preliminary test these were carried out.

That the propeller was considered satisfactory by the Gloucester Company following these modifications is shown both by the conversation between Mr. Folland and our Maj. Barlow, and also by the fact that the Gloucester Company subsequently ordered further propellers, and stipulated that they were to be exactly the same as our original one after modification.

We have further to state that no complaint was made whatsoever to this company following the modifications mentioned, and the tests were in every way satisfactory. The writer was himself at Bay Shore during the preliminary trials, as was also Mr. Longden and Mr. Folland, and there was ample opportunity to comment upon any fault in the propellers.

The sole question raised was with reference to the fitting of the boss in that one of the spare propellers did not assemble on the boss provided, being too deep. We have since investigated this and found that all propellers delivered came within the quoted limits.

The fact that the American machines were fitted with Reed propellers having the new type of boss, of which we had no knowledge other than that experiments were being carried out, is of no importance. The new construction permits of the correct pitch angle being carried right up to a spinner of very small diameter, such as was that fitted on the Curtiss machines, but the large diameter spinner of the Gloucester almost entirely covered the double bend in the centre of the propeller necessitated by the type of boss that we use. Reference to contemporary photographs of the machine will show that with the exception of a very small portion close to the spinner the whole of the blade was working at the correct pitch angle.

We note that Mr. Longden states that he is taking the question up with the makers. It is now six weeks since the race, and we have received no complaint. Moreover, Mr. Longden travelled back with the writer on the *Berengaria*, and there was ample opportunity to raise the question.

In view of the fact that Mr. Longden's company had undertaken to supply racing machines for which the power plant would require a form of propeller on which he was dependent on a rival company, it appears that he was fortunate not only in the fact that this company had taken up the manufacture of this propeller so that he was able to obtain one from a British source, but also provided him with a ready-made excuse if the performance of his machine should prove disappointing.

THE FAIREY AVIATION CO., LTD.,

Hayes.

C. R. FAIREY, Chairman

December 7, 1925.

[2107] We notice in this week's issue of *FLIGHT* a letter from the Gloucester Aircraft Co., Ltd., regarding the question of propellers in the Schneider Cup race. We note that Mr. Longden deals with the question of the performance of the propellers, but no mention is made by him regarding the question of the spare propellers fitting the hubs.

In view of the recent anxiety of various people to "face facts," no doubt your readers will be interested to know the facts regarding this point, which are as follows:—

The spare propellers sent out direct from the makers' works would not fit the Napier hubs when they were required in America. This was not a case of "not fitting the hubs as well as they might have done," but a case of "not fitting the hubs at all," so that they could not be used and were completely useless.

This, we hope, makes the position quite clear from our point of view.

For and on behalf of

THE SUPERMARINE AVIATION WORKS, LTD.

(JAMES BIRD), Managing Director

Southampton, December 9.

IN PARLIAMENT

Royal Air Force

SIR F. SYKES, on November 24, asked the Secretary of State for Air whether, prior to placing orders abroad for parachutes for the Royal Air Force, British firms were asked to tender for the supply of Royal Air Force requirements on contract conditions placing on the manufacturer liability, if any, in respect of patent rights; and whether such provision is a customary feature of Air Ministry contracts?

SIR S. HOARE: The parachutes on order for the Royal Air Force are a proprietary article, and the contract was not placed as the result of competitive tendering. In the case of competitive tenders being invited for the supply of proprietary articles, it is usual for the Department to assume responsibility for infringement of patent rights.

Foreign Aircraft and British Engines

SIR F. SYKES asked what long-distance demonstration flights have been carried out since the war by foreign-owned aircraft employing engines of British origin; and what regular air transport services under foreign ownership employ British engines?

SIR S. HOARE: As regards the first part of the question, the following long-distance demonstration and analogous flights have been carried out by foreign-owned aircraft employing engines of British origin, namely:

Country.	Flight.	Engine.	Date.
Holland	Amsterdam-Batavia (about 9,500 miles)	Rolls Royce Eagle IX	October and November, 1924.
Russia	Moscow-Pekin-Shanghai (about 5,000 miles)	Siddeley Puma	June-July-August, 1925.
Sweden	Malmo-De Mok-Felixstowe and back (about 1,500 miles)	Eagle IX	June, 1925.
Norway	Spitzbergen-81 deg. N. and back (about 1,400 miles)	Eagle IX	May and June, 1925.
Spain	Marina di Pisa (Italy) to Mar Chica (Morocco) (about 1,000 miles)	Eagle	August and September, 1924.
Italy	Attempted Round the World Flight. (Abandoned after approximately 3,545 miles had been covered.)	Eagle	July and August, 1924.
Portugal	Lisbon to Rio de Janeiro (4,352 miles). (Machine was damaged beyond repair when alighting at St. Paul's Rock, after completing 2,352 miles, the flight being resumed with other machines.)	Eagle	March-June, 1922.
Belgium	Brussels to Kinshasa (Congo) (about 5,000 miles)	Eagle IX and Puma	February to April, 1925.
France	Toulon to Casablanca (about 1,500 miles)	Bristol Jupiter built under licence by the Gnome-Rhone Company.	1925.
Argentina	Amsterdam to Tokio (about 10,000 miles)	Napier "Lion"	July-October, 1924.

As regards the second part of the question, the following regular air transport services under foreign ownership employ British engines:

Country.	Company.	Engine.
Belgium	Société Anonyme Belge d'Exploitation de la Navigation Aérienne	Rolls Royce Eagle IX and Siddeley Puma.
Columbia	Sociedad Colombo-Alemana de Transportes Aereos	Eagle VIII.
Czecho-Slovakia	State Air Line	Puma.
Denmark	Dansk Luftfartsselskab	Puma and Eagle VIII.
Germany	Aero Lloyd	Puma and Eagle VIII.
Holland	Koninklijke Luchtvaart Maatschappij	Puma and Bristol Jupiter.
Hungary	Magyar Legiforgalmi	Eagle VIII.
Poland	Polski Aerolot	Eagle VIII.
Soviet Russia	Deruluf	Eagle VIII.
.. ..	Dobrolot	Puma.
.. ..	Ukrvozdukhpnt	Rolls Royce Falcon.
Spain	Compania Espanola de Trafico Aereo	Puma.
Sweden	Nordiska Flygredieriet	Eagle VIII.
Roumania	State Air Line	Puma.

Curtiss Engines

COL. WOODCOCK, on November 25, asked the Secretary of State for Air whether the 30 Curtiss engines for aeroplanes recently purchased will be subjected to the inspection of the British Aeronautical Department; do these engines comply with the recommendation of the Aeronautical Fire Prevention Committee with regard to the position of the carburettor; and whether an engine of this type has been subjected to a type test at Farnborough, and what was the result?

SIR S. HOARE: In answer to the first part of the question, the materials and manufacture of the engines referred to are being inspected during production by the Inspection Department of the United States Government. The engines will further be subjected by the Air Ministry to the same bench tests and internal examination as those applied to all British engines. As regards the second part of the question, I am not aware of any specific recommendation of the Fire Prevention Sub-Committee in regard to the position of the carburettors, but their general recommendations make it desirable that carburettors should be disposed, where practicable, in a different manner to that adopted in the Curtiss engine. I wish to remind my hon. and gallant friend that a recommendation from the Fire Prevention Sub-Committee is only one of numerous considerations which the Air Ministry must bear in mind in determining Service requirements, and it may be added that the position of the carburettors in the Curtiss engine, is similar to that of the carburettors in over 2,000 engines in regular use in the Royal Air Force at the present time. As regards the last part of the question, an engine of the type in question has been tested at the Royal Aircraft Establishment, Farnborough, and failed in a duration test after completing 78 hours instead of the full 100 hours laid down for the test. As a result of this test certain modifications have been incorporated in the 30 engines now on order.

Col. Woodcock asked the amount expended on the 30 Curtiss engines for aeroplanes which were purchased through a British firm but manufactured in America; and was he aware at the time of placing the order that the British firm who were to supply the engines were obtaining them from America?

SIR S. HOARE: It would be contrary to the general Government practice to give the information asked for in the first part of the question. The answer to the second part is in the affirmative.

Capt. Benn: Is it not in the best interests of the Air Force that the best type of engine should be secured from whatever source?

SIR S. HOARE: Yes, undoubtedly, but I hope that, normally, that source will always be British.

Lieut.-Commander Kenworthy: Is it not a fact that up to now there is a practical monopoly in the 450 h.p. water-cooled engine, and that this is an attempt to break the monopoly?

SIR S. HOARE: No Sir, this is not an attempt to break any monopoly; it is an attempt to make an experiment with a view to our obtaining the swiftest flying squadron of the kind anywhere in the world.

Colonel Woodcock: Did this engine pass the test at Farnborough?

SIR S. HOARE: No, Sir. In the answer which I have circulated, it will be seen that it has not yet passed the test, and I am not accepting delivery until it has.

Lieut.-Commander Kenworthy: Is not this the engine which won the Schneider Cup the other day?

SIR S. HOARE: I could not answer that question without notice.

Major-General Sir Frederick Sykes asked the value of American-built engines and spare parts on order for the Air Ministry and the estimated value of further purchases which will have to be made abroad for maintenance or replacement.

SIR S. HOARE: As regards the first part of the question, one order involving the purchase of American-built engines has been placed, but it would be contrary to the general Government practice to state the contract price. As regards the second part of the question, it is not possible to give an exact estimate of the value of the spare parts and replacements which will be necessary, but I would add that the present order is limited to the purchase of 30 engines for purely experimental purposes, and the expenditure in connection with the maintenance or replacement of parts for these should not be large.

Parachutes

LIEUT.-COLONEL SIR FREDERICK HALL asked the Secretary of State for Air whether, with regard to the contract covering several years which had been entered into for the supply of American parachutes for the Royal Air Force,

Engine.	Date.
Rolls Royce Eagle IX	October and November, 1924.
Siddeley Puma	June-July-August, 1925.
Eagle IX	June, 1925.
Eagle IX	May and June, 1925.
Eagle	August and September, 1924.
Eagle	July and August, 1924.
Eagle	March-June, 1922.
Eagle IX and Puma	February to April, 1925.
Bristol Jupiter built under licence by the Gnome-Rhone Company.	1925.
Napier "Lion"	July-October, 1924.

he will give particulars of the contract and state reasons for entrusting the supply of the parachutes to a foreign firm.

SIR S. HOARE: The particulars of the contract in question, except as regards price, which it is not the practice to disclose, are these: The contract was for a total of 2,261 parachutes, of which 1,500 were to be manufactured in America, it being stipulated that the balance and any further supplies should be manufactured in Great Britain, preferably under licence. Supplies of American manufacture are now coming in, and it is expected that supplies from the home source will begin to come forward by next July. As regards the last part of the question, the Irving parachute, which was adopted as the most suitable, is a proprietary article, and as the supply was very urgently needed and as no risk of possibly imperfect manufacture by an inexperienced firm could be run where a life-saving apparatus was in question, it was considered inadvisable to entrust the order to any firm other than the Irving Company.

Fatal Accidents

SIR F. HALL asked what is the number of accidents which have taken place in the Royal Air Force during the 12 months ended September 30, 1925, due to machines crashing, and how many lives have thereby been lost; in the case of how many of these accidents were parachutes available for the use of the crew in the event of things going wrong; and if he will state whether any machines are now allowed to go up unequipped with parachutes?

SIR S. HOARE: The word accident is a wide one and would cover a large number of minor mishaps, in landing or otherwise, to which I assume my hon. and gallant friend is not referring. On the assumption that fatal accidents are referred to, the answer to the first part of the question is 42 accidents involving 57 deaths; to the second, that in no case were the machines actually equipped with parachutes, although some units, in which no serious accidents happened to occur, were so equipped in August and September; to the last, that provision is now being made, as speedily as possible, for the equipment of the whole Air Force with parachutes, on the basis of one parachute for every seat in an aircraft, but this provision is not yet complete.

SIR F. HALL: Can the right hon. Gentleman say how long it will probably be before each seat is provided with a parachute?

SIR S. HOARE: I am afraid I cannot give a definite answer as to the date. I am expediting as far as I can the delivery of orders from America and the preparation of the machines to take the parachutes here.

Home Defence Strength

LIEUT.-COMMANDER KENWORTHY asked what increase had taken place in the number of service machines and pilots, respectively, available for the instant defence of the country and stationed in Great Britain, since August 1 last.

SIR S. HOARE: The establishment of the force allotted to home defence has been increased since August 1 last, by four squadrons of the auxiliary type, and these squadrons are in course of formation; when completed they will represent an addition of 48 service aeroplanes and 88 pilots to former effectives.

Empire Air Routes

COLONEL DAY asked what provision is being made towards the provision of Empire air routes for aeroplanes or airships between capitals of the Empire?

SIR S. HOARE: As regards aeroplanes, I hope to be in a position to make an announcement with regard to a commercial aeroplane service to India at an early date. As regards airships, the question of their operation on Empire routes must await the result of the experimental and constructional work now in progress.

Colonel Day: Has not the right hon. Gentleman stated that it is hoped soon to start a route to India?

SIR S. HOARE: I have stated so, and I hope a start will be made not later than next winter.

Parachutes

SIR F. SYKES asked whether the silk employed in the manufacture of parachutes abroad for the Royal Air Force is of British production?

SIR S. HOARE: These parachutes are being made from silk woven in Japan. I may add that the manufacturer is understood to have satisfied the United States Government, who are large users of this parachute, that silk of satisfactory quality for this particular purpose is not at present obtainable in America, but that I propose to reconsider this question with a view to the use of British silk, if possible, so soon as I can arrange for the manufacture of these parachutes to commence in this country.

SIR F. SYKES asked the Secretary of State for Air whether he is aware that the American Irving-type parachute under order by the Air Ministry omits certain safety devices, but is claimed in other respects to infringe British

patents covering a type at one time experimented with in this country; whether he has received information that this last-mentioned type is now regarded by the inventor as obsolete and as less efficient than subsequent British designs; whether the Air Ministry have received and considered any comparative statements by British designers of the merits of the Irving and British types; whether they are completely satisfied that no type of parachute exists affording greater safety than that of the Irving type in design, workmanship, and/or operation; and whether he is prepared to make a statement in regard to the technical aspects of this order?

Sir S. Hoare: As regards the first part of the question, the contention of a British inventor that the Irving parachute infringes his patent is at present under investigation. As regards the second part, I am aware that this inventor has designed a parachute which he considers to be an improvement upon the type submitted by him some years ago, but as he has not yet afforded the Air Ministry a reasonable opportunity of testing his latest type, I am unable to institute any comparison between its merits and those of the Irving. As regards the third and fourth parts, I am not prepared to assert that further research and experiment will not result in parachutes giving even greater immunity from risk than does the Irving; but in view of the urgent necessity of equipping the Royal Air Force with a reliable parachute I decided, for the reasons stated by me in the House on the 26th February and 24th June last, not to await the progress of experiments, but to adopt a device which had already reached the stage of successful production and whose serviceability had been demonstrated beyond question over a long period of practical air experience. I do not think it practicable to make a technical statement within the limits of a reply to a question.

Metal Propellers

SIR F. SYKES asked what orders have been placed abroad by the Air Ministry for metal propellers, and what is the value of those orders; what expenditure was incurred by experimental orders for metal propellers of British and foreign manufacture, respectively, in the 12 months preceding the last of these foreign orders; and what steps were taken to secure British production of the type selected prior to the placing of the order abroad?

Sir S. Hoare: As regards the first part of the question, no trace of an order placed abroad for metal propellers can be found in the records of the Air Ministry; the other parts of the question, therefore, do not arise.

Royal Air Force Accidents

CAPTAIN FOXCROFT, on November 26, asked the Secretary of State for Air on how many occasions during the 12 months ending September 30, 1925, were courts of inquiry held to inquire into aircraft accidents; were the witnesses sworn; were counsel present, with liberty to examine and cross-examine, representing relatives of deceased and others concerned; and, if counsel were not present, was this due to the parties interested not desiring their presence?

Sir S. Hoare: As regards the first part of the question, 179 courts of inquiry were held to investigate aircraft accidents in the Royal Air Force during the period named. As regards the remaining part of the question, such courts of inquiry are neither open courts nor judicial tribunals, and it is extremely rare for witnesses to be sworn or for counsel to be present, but to give a precise answer to the question asked by my hon. and gallant Friend would involve a detailed scrutiny of the proceedings of each of the courts of inquiry above referred to, and in the circumstances I do not think that the labour entailed would be justified.

Germany and British Aeroplanes

MR. CAMPBELL asked the Secretary of State for Air whether, in the event of the impending evacuation of Cologne, the English Imperial Airways, Limited, will be able to maintain its London-Cologne service as hitherto, in view of the fact that its aircraft does not correspond with the restrictions valid for Germany; and whether he can take any action to secure the continuance of its operations?

Sir S. Hoare: The question referred to, with others relating to the evacuation, is under consideration, and I would prefer not to make any statement at present.

Royal Air Force and Insurance

MR. HARRISON, on November 30, asked the Secretary of State for Air whether he has set up a committee to inquire into the question of a scheme of State-aided insurance for those ranks of the Royal Air Force whose duties necessitate their presence in flying machines when in the air; and, if so, when their Report can be expected?

Sir Samuel Hoare: The question of reasonable insurance facilities for flying personnel has been under active consideration in my Department since my statement last June, and I have been in continuous communication with the insurance offices on the subject. No committee has been appointed, and I do not think that it will be necessary to set one up, as I have strong hopes of being in a position to make a satisfactory announcement at an early date.

Officers seconded to R.A.F.

Major GLYN, on December 1, asked the Secretary of State for Air how many officers of the Army and Air Force have been seconded from one Service to the other under the scheme authorised by the Air and Army Councils in November, 1920; how many officers are there on the Reserve for the Royal Air Force; and what proportion are fully qualified pilots at the present date?

Sir Samuel Hoare: 106 Army officers have been seconded to the Royal Air Force under the scheme referred to. The scheme for the secondment of Royal Air Force officers for the Army was not intended to be put into immediate operation, and no secondments have yet been made. The answer to the second part is 938, and to the last part 648, of whom 549 are in regular flying practice and immediately available. In addition, 14 Reserve officers are at present undergoing *ab initio* flying training.

R.A.F. Recruit's Release

MR. SCRYMGEUR, on December 2, asked the Secretary of State for Air what is the lowest sum demanded by the Air Service for release of a recruit under special circumstances; whether there is a period beyond which such discharge cannot be sanctioned; and, if so, what is that period?

Sir Samuel Hoare: As regards the first part of the question, airmen are entitled to claim their discharge within three months of the date of attestation on deposit of a sum of £20. As regards the last part, discharge other than that above referred to is a privilege granted only subject to the requirements of the Service, and the sums required to be paid in the varying circumstances are laid down in paragraphs 578 and 581 of the King's Regulations and Air Council Instructions for the Royal Air Force. The minimum payment is £17 10s.

R.A.F. Buildings

COLONEL GRETTON asked if it is the policy of the Air Ministry to proceed expeditiously to erect and acquire buildings; and when it is anticipated that requirements for buildings both for the use of the Ministry and of the Air Force will be satisfied?

Sir S. Hoare: The answer to the first part of the question is in the affirmative, but naturally the prevailing financial stringency must be taken continuously into account. As regards the second part, the expansion of the

Air Force for home defence is still in progress, and it is not, therefore, possible to state a date by which requirements will be fully met.

Mr. Thurtle: Is the signing of the Locarno Pact likely to affect this programme in any way?

Sir S. HOARE: That is certainly a question that must be taken into account when the general problem of disarmament is considered.

Sir F. Wise: May I ask whether the buildings at Halton are still going on?

Sir S. Hoare: Yes, Sir.

Purchase of Land, Castle Bromwich

MR. SCURR asked the Secretary of State for Air whether, seeing that buildings and 179 acres of land, at Castle Bromwich, Birmingham, have been purchased by the Air Ministry for £60,000, he can say whether it is proposed to build a new aerodrome on this site; if so, the estimated cost; whether this land was formerly in the possession of the Ministry; and, if so, what was the price realised at its sale?

Sir S. Hoare: As regards the first and second parts of the question, it is not proposed to build a new aerodrome, but merely to recondition and modify the existing buildings in such a way that, with some timber hutting, they will meet the requirements of an Auxiliary Air Force squadron, and the estimated cost thus involved is £30,000. As regards the third and fourth parts of the question, the land was formerly occupied under compulsory powers, not owned, by the Air Ministry, and when it was relinquished the price realised for the buildings by the Disposal Board, including both those sold for removal and those left *in situ*, was £18,000.

Mr. Harmsworth: May I ask whether the right hon. Gentleman realises that this land works out at about £335 an acre, and whether he considers that any other land cheaper than that would not have done as well?

Sir S. Hoare: We made very full investigations in the neighbourhood. Our difficulty was to get land close to Birmingham and neighbourhood. I am afraid this was the cheapest land we could find.

Fatal Accidents

BRIGADIER-GENERAL BROOKE asked the Secretary of State for Air if he is aware that there have been 50 lives lost in the Royal Air Force since the beginning of the year; whether in all these cases inquiries were held; and, if so, whether he will analyse the causes of these mishaps?

Sir S. Hoare: In answer to the first part of the question, there have been 39 fatal accidents in the Royal Air Force since the beginning of the year, resulting in 55 deaths of personnel; to the second, courts of inquiry were held in all cases, and every other available means, including in the case of accidents at home an independent inquiry by the Accidents Investigation Branch, was employed to determine the causes of the accident with a view to preventing, so far as possible, their recurrence in the future; to the third, that the 39 accidents may be analysed under the following heads: Accidents due to engine or installation failure, 3; to error of judgment, 19; to defect in aircraft constructional, 1; to miscellaneous or as yet undetermined causes, 16.

Aircraft and Personnel

COLONEL GRETTON asked what number of machines are in possession of the Air Force in Great Britain and the out-stations, respectively, immediately ready for flight on war service on emergency; and what is the present number of pilots and observers, respectively, available for immediate service?

Sir S. Hoare: As regards the first part of the question, the present distribution of first line units of the Royal Air Force, with an average of 12 machines to a squadron, is 27½ squadrons at home, the equivalent of 9 squadrons for the Fleet Air Arm and 18½ squadrons distributed between India, Iraq, Egypt, Palestine, Aden and Malta. The answer to the last part of the question is 2,163 pilots and 29 observers.

Colonel Gretton asked for the number of machines immediately ready for flight on emergency.

Sir S. Hoare said he might take it that from 10 to 12 machines are available in each squadron.

R.A.F. Machines and Engines

SIR F. SYKES asked the Secretary of State for Air how many machines of the type fitted with American Curtiss engines have been purchased and tested by the research department of the Air Ministry; how many are now on order; what is the customary and what the maximum post-War practice as to the number of machines purchased for experimental test by the research department; and what is the largest number of machines previously ordered for service squadrons under a post-War contract placed prior to completion of standard tests by the engine to be fitted?

Sir S. Hoare: The answer to the first part of the question is none; the experimental machine which was built by the British contractor at his own expense and remained his property during the tests has not been purchased by the Department. As regards the second part, 18 machines are about to be ordered. As regards the third part, whilst there is no hard-and-fast procedure, the general practice is that if the research department requires a machine to a certain specification, an order for three is normally given to each firm selected; but as many as 11 have on occasion been ordered to one specification. This procedure is, however, not applicable to the case now in question in which an experimental machine was produced displaying certain satisfactory results which made it desirable to try it out for operational purposes on a squadron basis. As regards the last part of the question, an order for 30 machines was recently placed with a British manufacturer two months before the British engine for which they were designed had actually passed the type test. In this case, as in that of the Curtiss, the contract was proceeded with as soon as it became evident that the completion of the engine test after certain modifications was no longer in doubt.

Lieut.-Commander Kenworthy asked how many firms in Great Britain are supplying water-cooled aeroplane engines of 450 to 500 h.p. for the use of His Majesty's Air Force?

Sir S. Hoare: The answer is one company at present, but another company is building an experimental engine within the horse-power limits mentioned, and it depends upon the results of the tests whether this second type of engine is adopted for supply to the Royal Air Force.

Parachutes

SIR F. SYKES, on December 3, asked the Secretary of State for Air under what British patents property in the design of the Irving type parachute was vested in the American manufacturer at the time the Royal Air Force order was placed in America; the period over which deliveries of parachutes on order are permissible under the existing contracts; and whether power is held by the Air Ministry to terminate the contracts without compensatory payment in the event of an improved type of parachute being discovered and developed during the course of this period?

Sir S. Hoare: As regards the first part of the question, I am not aware of any British patent covering the design of the Irving parachute which is owned by the Irving Air Chute Company. As regards the second part, the contract provides that delivery of the 1,500 parachutes to be made in America shall be completed by the end of December, 1926, but it is probable that this delivery date will be substantially anticipated; no rate of delivery has yet been agreed in respect of the parachutes to be made in this country. The answer to the last part of the question is in the negative.

THE ROYAL AIR FORCE

London Gazette, December 1, 1925.

General Duties Branch

The following are granted short service commissions as Pilot Officers on probation, with effect from and with seniority of Nov. 28:—C. A. Anderson, J. L. Adams, R. Benham, T. B. Byrne, J. F. Dowdeswell, A. E. G. Eccleston, L. G. Gray (Capt., Indian Army, retd.), D. V. Ivins, H. J. J. Mumford-Mathews, F. J. Parker, J. G. Parkin, L. C. Phillips, L. H. Smith, E. G. C. Stokes, R. J. Stone (2nd Lieut., Norfolk Regt., T.A.), R. O. O. Taylor, E. L. Wilson, R. H. Winn, W. G. Woolliams. The following Pilot Officers on probation are confirmed in rank:—D. S. E. Vines (Nov. 6); C. Heard-White (Nov. 14) (substituted for Gazette, Oct. 6). The following Pilot Officers are promoted to rank of Flying Officer:—J. A. P. A. Yearsley (May 15); S. E. Bulloch (Aug. 14); W. V. R. Nicholl (Nov. 15).

Flight-Lieut. J. W. Young, M.B.E., takes rank and precedence as if his appointment as Flight-Lieut. bore date July 1, his name to appear immediately below that of Flight-Lieut. E. J. Kingston-McCloughry, D.S.O., D.F.C., on the gradation list. Reduction to take effect from Sept. 22. Flying Officer A. E. T. Bruce is transferred to the Reserve, Class A. (Dec. 2). Gazette, Nov. 3 concerning Pilot Officer on probation F. Sisson is cancelled.

Stores Branch

The following Captains, Corps of Military Accountants, Army, are granted permanent comms. as Flying Officers on probation, with effect from and

with seniority of Nov. 24:—L. Horwood, M.C., F. B. Ludlow, O.B.E., M.C., L. L. Bray, P. Alderson, H. D. Giblett. The following are transferred to Stores Branch on probation in the ranks stated (Nov. 24):—Flight Lieut.—L. A. K. Butt. Flying Officers—B. E. Essex, H. J. Hunter, W. F. Langdon.

Accountant Branch

Pilot Officer on probation S. C. George is confirmed in rank, and is promoted to rank of Flying Officer, with effect from Dec. 3, and with seniority of Nov. 10.

Medical Branch

Flight-Lieut. W. F. Wilson, M.C., M.B., is promoted to the rank of Squadron Leader (Nov. 25).

Reserve of Air Force Officers

General Duties Branch

T. Salway is granted a commn. in Class A.A. as a Pilot Officer on probation (Nov. 16); R. McLaughlin is granted a commn. in Special Reserve as a Flying Officer on probation (Dec. 1). The following Flying Officers are transferred from Class A to Class C:—G. H. Wenn (May 18); C. E. F. Arthur (Oct. 1); A. J. H. Taylor (Oct. 24).

Memorandum

Cadet G. S. Vaughan is reappointed to an honorary commn. as a 2nd Lieut. on discharge from the Army (Sept. 1).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Wing Commander W. L. Welsh, D.S.C., D.F.C., to R.A.F. Depot, pending disposal on transfer to Home Estab., 17.11.25.

Squadron Leaders: E. R. L. Corballis, D.S.O., to H.Q. Palestine, 30.10.25. A. D. Pryor, to R.A.F. Depot, 26.11.25. A. J. Currie, to R.A.F. Depot, on transfer to Home Estab., 27.11.25. F. P. Don, to Air Ministry, 1.12.25.

Flight Lieutenants: C. Turner, A.F.C., to Aircraft Depot Egypt, 25.10.25. A. J. Long, to Aircraft Depot, Egypt, 6.11.25. D. Colyer, D.F.C., to H.Q. Iraq, 25.10.25. J. A. Sadler, to R.A.F. Depot, on transfer to Home Estab., 14.11.25. H. Hackney, to R.A.F. Depot, on transfer to Home Estab., 14.11.25. J. I. T. Jones, D.S.O., M.C., D.F.C., M.M., to No. 216 Sqdn., Egypt, 17.10.25. A. W. Clemson, O.B.E., D.S.O., to No. 3 Group H.Q., Spittlegate, 1.12.25. W. J. Daddo-Langlois, to No. 480 Flight, Calshot, 9.12.25. M. B. Frew, D.S.O., M.C., A.F.C., to Armament and Gunnery Sch., Eastchurch, on transfer to Home Estab., 16.12.25. G. E. Gibbs, to No. 25 Sqn., Hawkinge, 14.12.25. E. J. Cuckney, D.S.C., to R.A.F. Depot, on transfer to Home Estab., 30.10.25. N. H. Jenkins, O.B.E., D.F.C., D.S.M., to No. 30 Sqdn. Iraq, 9.11.25. E. B. Mason, to Aden Flight, 19.11.25.

Flying Officers: J. B. Knockner, to No. 28 Sqdn., India; 18.11.25. W. J. M. Akerman and A. D. Davies, to No. 31 Sqdn., India; 18.11.25. G. I. C. Peacocke, J. L. F. Fuller-Good and E. C. de V. Lart, to No. 27 Sqdn., India; 18.11.25. H. A. Castaldini, to No. 14 Sqdn., Palestine; 18.11.25. E. W. T. Crouch, to Aircraft Depot, Egypt; 18.11.25. (Hon. Flight-Lieut.) J. C. E. A. Johnson and G. J. Southam, to No. 208 Sqdn., Egypt; 18.11.25. W. L. Payne, to Cairo-Cape Flight, Northolt; 6.11.25. F. W. Foster, D.F.C., D.S.M., to No. 27 Sqdn., India, instead of to No. 28 Sqdn., as previously notified, 2.10.25. H. N. Thornton, to No. 14 Sqdn., Palestine, 12.11.25. C. G. Hancock, to R.A.F. Depot, on transfer to Home Estab., 14.11.25. (Hon. Flight-Lieut.) R. Kennedy, to R.A.F. Base, Malta, 31.10.25. A. M. Rowe, to No. 6 Armoured Car Co., Iraq, 8.11.25. J. F. F. Pain, to No. 1 Flying Training Sch., Netheravon, on appointment to a Temp. Commn. on being seconded from the Army, 28.11.25. S. F. Cole, to R.A.F. Base, Calshot, 3.11.25. (Hon. Flight-Lieut.) H. R. B. Howell, to R.A.F. Base, Gosport, 3.11.25. A. A. Jones, to Cairo-Cape Flight, Northolt, 30.11.25. C. H. Ratcliffe, to No. 99 Sqdn., Birmham Newton, 3.12.25. A. C. Addams, to No. 41 Sqdn., Northolt, 7.12.25. E. A. McKinley-Hay, to No. 502 Sqdn., Aldergrove, 11.12.25. H. K. Goode, D.S.O., D.F.C., to Aden Flight, 19.11.25. R. L. Edward, to No. 1 Flying Training Sch., Netheravon, on transfer to Home Estab., 10.12.25.

Pilot Officers: A. F. Hutton, J. C. Marcy and D. Robinson, to No. 5 Sqdn., India; 18.11.25. G. W. P. Irwin, to No. 31 Sqdn., India; 18.11.25. C.

Feather and H. S. Martin, to Aircraft Depot, India; 18.11.25. A. N. Francome, to No. 27 Sqdn., India; 18.11.25. W. V. R. Nicholl, to No. 70 Sqdn., Iraq; 18.11.25. L. S. Birt, to No. 1 Sqdn., Iraq; 18.11.25. F. M. Denny, to No. 30 Sqdn., Iraq; 18.11.25.

Pilot Officers: C. A. Anderson, J. L. Adams, R. Benham, T. B. Byrne, J. F. Dowdeswell, A. E. G. Eccleston, L. G. Gray, D. V. Ivins, H. J. J. Mumford-Mathews, F. J. Parker, J. G. Parkin, L. C. Phillips, L. H. Smith, E. G. C. Stokes, R. J. Stone, R. O. O. Taylor, E. L. Wilson, R. H. Winn, and W. G. Woolliams; all posted to No. 1 Flying Training Sch. Netheravon, on appointment to Short Service Comms. (on probation) with effect from 28.11.1925. J. S. Georgeson to No. 502 Sqdn., Aldergrove, 11.12.25.

Stores Branch

Squadron Leaders: W. E. Aylwin, O.B.E., to Aircraft Depot, Iraq; 18.10.25. R. W. Thomas, O.B.E., to R.A.F. Depot, on transfer to Home Estab.; 15.11.25. T. Bell, M.M., to Stores Depot, Egypt; 18.11.25.

Squadron Leader: R. W. Thomas, O.B.E., to Air Ministry, 20.12.25.

Flight-Lieutenant: L. H. Hillier, to H.Q. Iraq; 30.10.25.

Flight Lieutenants: F. J. W. Humphreys, to Station Commandant, Basrah, 28.10.25. L. A. K. Butt, to No. 1 Stores Depot, Kidbrooke, 24.11.25. W. Sutherland, M.B.E., to R.A.F. Training Base, Leuchars, 9.11.25.

Flying Officers: W. B. Francis, to No. 601 County of London Sqdn., instead of to H.Q. Spec. Res. and Aux. Air Force; 16.11.25. A. J. Adams, to No. 600 City of London Sqdn. instead of to H.Q. Spec. Res. and Aux. Air Force; 26.10.25. L. N. Sargent, to No. 1 Sqdn., Iraq; 18.11.25. F. W. Taylor and F. W. V. Blommestein, to Stores Depot, Iraq; 18.11.25. W. A. G. Goldsworthy, to No. 27 Sqdn., India; 18.11.25. S. R. L. Poole, to Aircraft Depot, India; 18.11.25. C. N. Scott, to Aden Flight, Aden; 18.11.25.

NAVAL APPOINTMENTS

The following appointments were made by the Admiralty on November 12:—**Lieutenants, R.N. (Flying Officers, R.A.F.):** W. M. Healing and E. C. F. Price, to *Columbine*, and for No. 442 Flight; R. J. Berry, to *Furious*, and for No. 461 Flight; A. P. Colthurst and J. E. Vallance, to *Furious*, and for No. 462 Flight; Nov. 17.

Engineer-Commanders: R. S. Pearce, to *Ark Royal*, and J. W. Phillips, to *Blenheim*; Nov. 17; and J. W. Baguley, to *Ark Royal*, addl., for C.R.M. (on transfer).

The following appointments were made by the Admiralty on November 28:—**Lieutenant (E.) R.N. (Flying Officer R.A.F.):** K. A. B. Hutson, to *Furious* and for 421 Flight; Nov. 30.

Bantam-Weight.—Final: A. C. Callcott (Uxbridge) knocked out A. C. Price (Cranwell), a left-handed boxer, in the first round.

Light-Weight.—Semi-final: A. C. Hughes (No. 7 Group) beat A. C. Bexley (Shrewsbury) on points. A. C. Bailey (Cranwell) and L. A. C. Williams (Halton) were both disqualified for boxing too lightly. Final: A. C. Hughes, walked over.

Middle-Weight.—Semi-finals: A. C. Walker (No. 1 Group) beat L. A. C. Hockley (Shrewsbury) on points; A. C. Busanell-Wye (Henlow) beat A. C. Sully (No. 6 Group) on points.

Welter-Weight.—Semi-final: A. C. Perritt (Henlow) beat A. C. Templeton (No. 1 Group) on points. Perritt, who had been beaten by A. C. McCann (No. 6 Group), went into the final on the disqualification of McCann, on the ground that he was not eligible to compete in competition. Cpl. Kennard (Uxbridge) knocked out A. C. Fuller (Halton) in the second round.

Light-Heavy-Weight.—Semi-finals: A. C. Gates (Shrewsbury) beat A. C. Mather (Halton) on points; A. C. Hitchen (Uxbridge) knocked out A. C. Nasa (No. 6 Group) in the first round.

Heavy-Weight.—Semi-finals: A. C. Watts (Henlow) knocked out L. A. C. Mollett (No. 6 Group) in the first minute; A. C. Dean (No. 7 Group) beat A. C. Walter (No. 7 Group) on points.

R.A.F. Boxing

The eighth annual R.A.F. Boxing Association's novices' competitions for Sir Chas. Wakefield's cups concluded on December 3 at Henlow. The results were as follows:—

OFFICERS

Feather-Weight.—Final: P. O. Watkins (No. 2 Group), beat F. O. Robinson (No. 1 Group) on points.

Bantam-Weight.—Final: Flight Officer Stewart (No. 6 Group) knocked out P. O. Whitta (No. 3 Group) in the second round.

Light-Weight.—Final: F. O. Georgeson (No. 1 Group), beat P. O. Loughnan (No. 7 Group) on points.

Middle-Weight.—Flight Officer Hale-Munro (No. 6 Group) beat P. O. Merritt (No. 3 Group), the referee intervening in the second round.

Welter-Weight.—Semi-final: P. O. Frost (No. 1 Group) beat P. O. Pavin (Uxbridge) on points; F. O. Arbuthnot (No. 3 Group) beat F. O. O'Sullivan (Henlow) on points. Final: Frost beat Arbuthnot on points.

Light-Heavy-Weight.—Final: P. O. Thorn (No. 3 Group) beat Fl. Lieut. Spackman (No. 6 Group), the referee stopping the fight in the third round.

Heavy-Weight.—Final: F. O. Brodie (No. 7 Group) beat F. O. Sterling-Webb (Henlow) on points.

OTHER RANKS

Fly-Weight.—Final: A. C. Pretty (Cranwell) beat A. C. Watkins (Halton) on points.

ROYAL AERONAUTICAL SOCIETY

(Official Notices)



Postponement of Mr. Cobham's Lecture.—Owing to the flight which Mr. Cobham is undertaking to South Africa, he will be unable to lecture to the Society on December 17. It has been arranged instead that he will give his lecture on "Long-Distance Flights" on Thursday, February 25, 1926, at 5.30 p.m.

Informal Discussion.—Instead of Mr. Cobham's lecture, an informal discussion on "Aero Engine Starting Gear" will be held in the Society's Library on Thursday, December 17, at 6 p.m.

J. LAURENCE PRITCHARD, *Honorary Secretary.*

M. Dewoitine on Metal Construction.

We would remind our readers that it is on Tuesday of next week, December 15, that M. E. Dewoitine, the famous French aircraft designer, is to read his paper on "The Metal Construction of Aeroplanes," before the Institution of Aeronautical Engineers. Lieut.-Col. Moore Brabazon will take the chair, and Col. Belaiew, who is an accomplished linguist, will be present to help in the matter of translation. M. Dewoitine not speaking English as fluently as he would desire. We have had the privilege of examining an advance copy of the paper, which has been translated into English, and can assure our readers that it is of more than ordinary interest. The meeting will take place at 6.30 p.m., and non-members of the Institution will, we understand, be admitted. It should be remembered that this paper, like the remaining ones, will be read at the Junior Institution of Engineers, 39, Victoria Street, Westminster, London, S.W.1.

Air Mails

THE Postmaster-General announces that a winter edition (December, 1925) of the Air Mail Leaflet has been issued. A copy may be obtained free on application at any Head or Branch Post Office, or from the Secretary (Air Mails), General Post Office, London, E.C. 1.

Waziristan Operations ; Grants to Royal Air Force

THE Air Ministry announces : His Majesty the King has been graciously pleased to command that the India General Service Medal, 1908, in silver, with clasp "Waziristan, 1921-24," shall be granted to personnel of the Royal Air Force who took part with the military forces in the operations in Waziristan between December 21, 1921, and March 31, 1924. Provided that the claims are approved by the Air Council, the Medal and Clasp will be granted to all officers and airmen who were placed under the orders of the officers commanding, Royal Air Force, Waziristan, for duty, either in the air or on the ground, within the area of the operations, comprising North and South Waziristan, Bannu, Dera Ismail Khan civil districts, and that portion of the Mianwali district which lies west of the River Indus, and the military posts of Mari Indus and Darya Khan, east of the River Indus, between December 21, 1921, and March 31, 1924, both dates inclusive. Those already entitled to, or in possession of, the medal will receive the clasp only. Officers no longer serving may obtain the necessary form of application from the Secretary, Air Ministry, Adastral House, Kingsway, London, W.C.2, and airmen no longer serving, from the Officer i/c Records, Royal Air Force, Ruislip, Uxbridge, Middlesex. The forms, when completed, should be forwarded to the Secretary, Air Ministry.

Air Ministry Acquires Bently Priory

THE Air Ministry has acquired, for administrative purposes, Bently Priory, the celebrated and historic old country mansion on the top of Stanmore Hill. It possesses over 100 rooms and dates back—or rather, a certain portion of the present building does—to 1543, when it was presented to King Henry VIII by Cranmer.

An Airport on the Thames.

As a result, it is reported, of an amalgamation between the two French air companies—Air Union and Compagnie Aeronavale—an air port is to be established on the Thames, near Hammersmith Bridge, in connection with a London-Paris air service. The Port of London Authority has given the necessary permission, provided descents and ascents are made before 10 a.m.

Institution of Aeronautical Engineers.

It should be noted that the date of Mr. O. E. Simmonds' lecture has been changed from February 23 to March 9, 1926.

SIDEWIND

SIG. CAMPANELLI, the Marquis de Pinedo's mechanic during the historic Rome-Tokyo-Rome flight, has sent the following message to the Robinhood Engineering Works, Ltd. : " From Battavia to Melbourne, on our important raid, the ' K.L.G.' plugs, type F.15, have given insuperable results. Excellent starting—excellent slow march—excellent render during the flight." It will be remembered that the machine used on this flight was a Savoia S.16 ter flying boat fitted with a 400-h.p. Lorraine-Dietrich engine.

PUBLICATIONS RECEIVED

Reports : No. 208.—Determination of Turning Characteristics of an Airship by Means of a Camera Obscura. By J. W. Crowley, Jr., and R. G. Freeman. No. 210.—Inertia Factors of Ellipsoids for Use in Airship Design. By L. B. Tuckerman. No. 212.—Stability Equations for Airship Hulls. By A. F. Zahm. No. 215.—Air Forces, Moments and Damping on Model of Fleet Airship "Shenandoah." By A. F. Zahm and F. A. Loudon. The U.S. National Advisory Committee for Aeronautics, Washington, D.C., U.S.A.

Report on Civil Aviation, 1924. Dominion of Canada Department of National Defence, Ottawa, Canada.

Verslagen en Ver Handelingen van den Rijks-Studiedienst voor de Luchtvaart. Vol. III, 1925. Rijks Studiedienst voor de Luchtvaart, Amsterdam.

Aeronautical Research Committee : Reports and Memoranda, No. 975 (Ae. 189).—Autorotation Measurements on a Model Aeroplane with Zero Stagger. By F. B. Bradfield and L. P. Coombes. April, 1925. H.M. Stationery Office, Kingsway, London, W.C.2. Price 6d. net.

Annual Report of the Meteorological Committee to the Air Council, for the year ended March 31, 1925. H.M. Stationery Office, Kingsway, London W.C.2. Price 1s. 9d. net.

The Royal Air Force Rugby Union Handbook : Season 1925-26. Air Ministry, Kingsway, London, W.C.2.

The Air Pilot Monthly Supplement. No. 13. November, 1925. Air Ministry, Kingsway, London, W.C.2.

Federation of British Industries : Report on Visit to the United States of America. By Col. The Hon. F. Vernon Willey and G. Locock. The Federation of British Industries, 39, St. James's Street, London, S.W.1.

Aeronautical Research Committee, Reports and Memoranda : No. 973 (Ae. 188).—The Lateral Control of a Biplane by Combined Use of Ailerons and Varying leading Edge Slots. By G. P. Douglas, F. B. Bradfield, and A. S. Hartshorn. April, 1925. H.M. Stationery Office, Kingsway, London, W.C.2. Price 1s. net.

Rivista Aeronautica. Vol. I. No. 3. September, 1925. Direzione della "Rivista Aeronautica," Via Torino, 39, Rome. Price L.50.

AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations : Cyl. = cylinder ; i.c. = internal combustion ; m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

APPLIED FOR IN 1924

Published December 10, 1925

28,367. C. R. FAIREY. Landing-devices for seaplanes. (242,796.)

APPLIED FOR IN 1925

Published December 10, 1925

1,753. SIEMENS-SCHUCHERTWERKE GES. Airship stations. (242,216.)
3,489. L. ROBINSON. Ground anchor. (242,834.)

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